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(54) Title: FLAT PANEL DISPLAY SUBSTRATE TESTING SYSTEM

(57) Abstract: A flat panel display substrate (FPDS) testing system configured such that prior to testing, the FPDS is loaded into a pallet to prevent breakage, and to provide electrical connections to test pads on the FPDS. The system achieves high throughput by testing FPDSs using one or more charged particle beams simultaneously with the following operations: unloading of already-tested substrates, loading of substrates ready for testing, assembly of pallets, and alignment of electrical contactors to a large number of FPDS test pads. The system design eliminates a prior art X-Y stage, and all moving electrical connections to the FPDS during testing, reducing costs and improving reliability. In one embodiment, the FPDS testing system has three subsystems: a process chamber, loadlock assembly, and pallet elevator; in another embodiment, the functions of loadlock and pallet elevator are combined to reduce system footprint.